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FOR

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Snake-Poison, and reputed Antidotes for the same.

By CHARLES HORNE, Esq., B.C.S., F.Z.S.

(Continued from Zool. S. S. 1880).

The importance of the subject may be gathered from the fact recorded in the last Oude Administration Report, that 1,127 persons died from snake bites during the past year; and again, in the Central Provinces Administration Report, that 1,874 had died from the same cause during the three preceding years. These figures, referring to isolated districts of India, may afford some approximate idea of the mortality arising from this cause throughout India, and all other serpent-infested countries of the East.*

Experiments.—1. A full-grown cock was given to the kelaree (snake-man), who administered his antidote. The feathers having been plucked from one thigh, and partially off the breast, the bird was freely bitten more than once in our presence by a lively cobra over four feet long. The cock showed no symptoms of distress of any kind, and, after an hour, was let loose and ran about apparently uninjured: he did not, at any time subsequently, exhibit any symptoms of distress.

2. A rabbit would not have the antidote administered by the kelaree, whose hand it bit severely in the attempt to do so. The rabbit was then twice bitten by a cobra over four feet long, on each occasion giving vent to a painful cry: it was then let loose, the poison taking very rapid effect: the animal fell on one side, then sat up for a few seconds, after which it tumbled over; showed great distress, hurry and irregularity in its efforts to breath; heart's action became rapid, feeble and irregular; the pupils of both eyes were violently acted on by some foreign influence, ultimately became quite fixed, and, in 3½ minutes from the time of being bitten, the rabbit gave a convulsive shudder and was dead.

3. A full-grown pariah slut, seemingly in perfect health, was handed over to the kelaree, who administered his antidote in a piece of meat, which the slut swallowed in our presence at 8·39 A.M. She was then bitten on the inner side of the left thigh by a fresh cobra over four

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* These figures must be taken with great caution; although undoubtedly many lives are lost, as murders, especially of women, are often returned as death from snake-bite.—*C. H.*

BRITISH MUSEUM

feet long, which closed its jaws upon the place, holding on for some seconds. Several other attempts were made to make the cobra bite again; but it is not certain whether a second bite was given or not. The slut was then tied up, and meat was offered to her about an hour afterwards, at the instance of the kelaree, which she refused. He subsequently gave this as a reason why he thought his antidote had not been quite powerful enough; but said confidently, that the remaining effects of the poison would pass off in a few hours. The slut showed no symptoms of distress or lethargy for two hours, after which she lay down and appeared drowsy. The kelaree then administered a second dose of his antidote, which in the course of an hour entirely dissipated all drowsiness and weakness. At 1 P.M., the slut having been for about an hour and a half lively and apparently well, was let loose and ran away to the neighbouring village to which she belonged.

4. Another dog, full grown, in good condition and apparent health, was bitten at 8 45′ 50″ A.M. by a cobra over four feet long, the snake closing its jaws upon the place. Strong symptoms of uneasiness after three minutes, with very hurried and spasmodic breathing; pupil of eye violently acted on; in about fifteen minutes action of the heart much enfeebled and very hurried; pupil of eye still more evidently under a foreign influence; very shortly after this the breathing became more hurried and the animal very restless; frothy saliva also began to flow freely; the kelaree asserted the dog would go mad. Shortly afterwards, on putting anything within reach of his mouth, he snapped spasmodically and laid hold of a rope, but more convulsively than with any object. The first effects seemed to be excitement and distress, followed by considerable lethargy; after which its muscular efforts appeared to be nervously spasmodic, excited by some foreign influence, and evidently not voluntary. The hinder extremities first appeared to lose power; action of the heart hurried, weak and intermittent; about this pertod the pupil of the eye became fixed, lower jaw powerless, tongue lolling out and of a bluish black colour; breathing distressed, hurried and spasmodic, with only partial expansion of the chest. Died easily, after one or two spasmodic gasps, at 9·29 A.M., that is, in forty minutes and ten seconds after being bitten. Just before death it showed a dislike to the presence of water.—‘*Indian Medical Gazette.*’

PS. (by the compiler).—Experiments Nos 2 and 4 appear to have been quite unnecessary, as all know that animals die of cobra bites and the symptoms have often been described.

Before recording Dr. Fayrer's experiment, with reference to the above, I will here quote a very interesting paragraph from the ‘Microscopical Journal,’ by Mr. G. B. Holford, of Australia, as to the effect of snake-poison on the blood.

“The melancholy accident* which so lately happened with the cobra-di-capella induced me to make some experiments and observations upon the action of the reptiles' poison, and they have proved so eminently interesting that I am induced to send you an epitome of them.

“I have to state, that when a person is mortally bitten by a cobra-di-capella, molecules of living germinal matter are thrown into the blood and speedily grow into cells, and as rapidly multiply, so that in a few hours millions upon millions are produced, at the expense (as far as I can at present see) of the oxygen absorbed into the blood during inspiration; hence the gradual increase and ultimate extinction of combustion and chemical change in every other part of the body, followed by coldness, sleepiness, insensibility, slow breathing and death. The cells, which thus render in so short a time the blood unfit to support life, are circular, with a diameter on an average of $\frac{1}{1700}$ of an inch: they contain a nearly round nucleus of $\frac{1}{2800}$ of an inch in breadth, which, when further magnified, is seen to contain still more minute spherules of living germinal matter. In addition to this, the application of magenta reveals a minute nucleus spot at some part of the circumference of the cell: this, besides its size, distinguishes from the white pus or lymph corpuscle.

“Thus, then, it would seem that as the vegetable cell requires for its growth inorganic food and the liberation of oxygen, so the animal cell required for its growth organic food and the absorption of oxygen: its food is present in the blood, and it meets the oxygen in the lungs; thus the whole blood becomes disorganized, and nothing is found after death but dark fluid blood, the fluidity indicating its loss of fibrine, and the dark colour its want of oxygen, which it readily absorbs on exposure after death.

“Let it not be thought that microscopic particles are unable to produce such great and rapid changes. It is well known, and I have frequently timed it with my class, that a teaspoonful of human saliva will, when shaken with a little quantity of decoction of starch, convert the whole of the latter into sugar in less than one minute. If ptyaline, the active principle of saliva, exerts this power at most in a few minutes, then surely the active principal of the secretion of the serpent's poison-gland may exert an infinitely greater power in as many hours. It results, then, that a person dies slowly asphyxiated by deprivation of oxygen, in whatever other way the poison may also act, and, so far as the ordinary examination of the blood goes, the post mortem appearances are similar to those seen after drowning and suffocation. I have many reasons for believing that the materia morbi of cholera is a nearly allied animal poison. If so, may we not hope to know something definite of the poison of hydrophobia, small pox, scarlet fever, and indeed of all zymotic diseases?

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* Evidently alluding to Mr. Drummond's case of misplaced reliance on antidotes referred to in Col. Shavers' account.

"I will not take up your space further, as I intend to discuss the whole subject, which abounds with matter of the deepest importance to physiology and medicine, as critically as possible in my lectures at the University, which recommence next week, when I hope also to show the presence of the poison of our Australian snakes in the blood of bitten and inoculated animals, and to make some experiments on the possibility of saving life."

In estimating the value of the foregoing extremely interesting paper, it will be well to bear in mind the extreme susceptibility of the blood corpuscles to the action of oxygen when exposed to its influence in the air after removal from the vessels. The living germinal nuclei seen by Dr. Halford in the corpuscles of the snake-bitten animal after death may have been formed whilst the blood was being mounted as a microscopical object. This is the more likely in a hot country like Australia (Melbourne, I believe, was the spot where the experiments were made), and it is only in the last number of 'Scientific Opinion' that I observe an article showing that the nucleus, said to distinguish the blood corpuscle of Mammalia, is due only to delay in mounting blood as an object, and with care may be observed to form: hence my caution.

Shortly after this I find, in the 'British Medical Journal,' the following, showing that Professor Halford (Holford?) had been trying some experiments for saving life in cases of snake-bite:—

"We have received from Mr. Paget, of St. Bartholomew's Hospital, some details forwarded for publication by Professor Halford, of Melbourne, of three successful cases in which poisoning by the bite of venomous snakes has been treated by the injection of ammonia into the veins. In the first case, a man named Brown was bitten severely at about 11 A.M. by a large poisonous brown snake. He sucked the wound, applied a ligature of string, and drank freely of brandy to relieve faintness. At noon he became powerless, and coma and vomiting followed; the pulse was feeble, and pupils sluggish. He was brought to the surgery of Mr. Arnold, who excised the wound, applied strong ammonia locally, and employed galvanism, with the occasional administration of stimulants. The patient, however, continued to sink. Professor Halford was sent for, and the man now seemed dying: the Professor then injected some ammonia by a fine syringe into the radial vein: the effects were marvellous. In a short time the patient became sensible, and answered questions, and continued with proper attention to progress favourably.

Dr. Dempster Beckworth reports a second case, also successful: a male adult was bitten at 8 A.M. by a black snake; he sucked the wound; it was subsequently scarified, and ammonia applied locally; but he fell into a stupor, and at mid-day could not be roused. "I therefore," says Dr. Dempster, "injected liq. ammon. fort. into the saphena vein, and also hypodermically. This affected him at once, and, after the second ejection, he woke up and became sensible; his pupils, which had before been very sluggish, acted well, and his pulse rose from 56 to 70. After this he progressed well, with the exception of violent vomiting for twelve hours: he is now (November 15th) convalescent, but very weak. I, of course, continued the stimulant treatment, but I certainly attribute the man's recovery to the injection of ammonia, of which I altogether injected about twelve minims."

Professor Halford mentions, with reference to this case, that the liq. ammon. fort. should be diluted before injection in such cases with two or three times its quantity of water, and of this mixture from twenty to thirty drops should be injected into one of the larger veins. The syringe, he adds, should be carefully introduced, so as to give the ammonia a fair chance: he disapproves of merely throwing the injection under the skin, and believes that after the injection of the ammonia there is no necessity for resorting to the use of stimulants.

A third case is reported in the 'Newcastle Chronicle,' New South Wales. It is that of a young woman, at Lake Macquarie, dangerously bitten by a moderately large brown snake: apprehending immediate danger she at once sucked the wound, cut out the snake-bitten part, and tied a ligature round the finger about half an inch above the wound, and another at the wrist. She then rode off as speedily as possible to Newcastle for medical aid: on the way she was directed to Dr. Irwin, Lake Macquarie-road, whom she found at home. The doctor, seeing it was a bad case, immediately had recourse to Dr. Halford's remedy: he at first scarified the wound, and poured some ammonia into it: following up the Professor's directions he also opened a vein above the wrist, and with a syringe injected a quantity of ammonia into it; he then kept the patient in constant motion, notwithstanding which, however, at intervals, she appeared to be almost overcome with drowsiness, and at one time very nearly gave way to sleep. Dr. Irwin, with most commendable perseverance, then took the woman by the arm and walked her round the room till two o'clock in the morning, when she rallied, the drowsiness having left her. On Thursday she appeared to have quite recovered, and returned home.

It is usually understood that the bite of brown snakes is excessively dangerous: these results are of the highest interest, and are most promising. They will, of course, attract the immediate attention of our Indian readers, and we shall hope to receive early confirmatory reports of the efficacy of the ammonia injections, which should, of course, be carefully employed, and of no greater strength and quantity than that recommended.

I will now extract, from the 'Indian Medical Journal' for February, Dr. Fayrer's experiments, made in consequence of Col. Showers' communication already quoted:—

"Col. Showers having very kindly brought the man who administered the antidote to Calcutta, and expressed his wish that its effects should be tested, I accordingly, with the assistance of three gentlemen, proceed to make the following experiments, the kelaree (snake-man) having been allowed to make any preparation that he deemed necessary on the day preceding, and in the morning of the day on which the experiments were performed. It is right to note that he says, on the day of the experiments, that the antidote he has now with him is not the most potent one he knows, but that, owing to the absence of rain, he had not been able to procure it, as the drought had prevented the growth of the plants from which it is derived. He expressed his belief that the drug he had with him would prove sufficient to counteract the influence of snake-poison. Accordingly a pariah dog was made over to him, and he administered to it a small piece of whitish-looking root, pounded and put in a piece of meat; this the dog (which was a full-grown pariah) ate readily. The kelaree next selected, from a basket of fresh cobras, a full-grown one of the spectacled variety, which was made to close its jaws three times in the dog's hind leg, just at the fold of the skin of the thigh, and in the thigh. The dog showed signs of pain when bitten, but had not evinced the least fear of the snake when it was brought near him: it was probably the first he had seen. The experiment was performed in the usual place, and as follows:—

Experiment, No. 1.—The antidote was given to the dog in a piece of meat at 11.55 A.M. of the 16th of January, 1869; at 11.59 the dog was bitten by a full-grown spectacled cobra of the variety known by the natives of Bengal as the "Gokurrah." The snake was made, by a snake-man occasionally employed by me, to close its jaws three times at the fold of the skin in the right thigh, and in the right thigh itself. We ascertained that the cobra had only one effective poison-fang, the other being broken; but with this he drew blood slightly.

"Noon. Dog licks the punctures; bitten leg weak; partially paralyzed.

"12.1 P.M. Dog lies down; shows indisposition to walk about.

"12.3. No pain apparently felt; is drowsy; refuses to be roused, and then walks about, but shows a tendency to lie down.

"12.5. Looks sleepy; roused, he walks; but soon lies down again.

"12.13. Breathing catching; is drowsy.

"12.17. Cannot walk without staggering; falls down when left alone; breathing hurried.

"12.20. Convulsed. The kelaree now applied some oil to the mouth and nostrils.

"12.21. Lies on the left side; universally convulsed; eyes glazed; pupils dilated, and insensible to light.

"12.22. Defecates; is pale and bloodless about the mouth and lips.

"12.23. Involuntary micturition.

"12.27. Respiration ceased.

"12.31. Dead.

"Ceased to breathe three minutes before the heart ceased to beat.

"Bitten at 11.59; died at 12.31; death in 32 minutes."

The above notes were taken by Dr. Ewart, who carefully watched and noted all the symptoms, and he adds the following remarks:—"There is evidence that death takes place through the nerve centres, the heart continuing to beat after the respiration entirely ceases, which can only be through its own inherent irritability and its own ganglionic supply, and quite independent of the medulla, which, in other respects, is *hors de combat* from three to four minutes before the heart actually ceases to pulsate."

This experiment, though unsuccessful in demonstrating the good effects of the reputed antidote, cannot be considered as conclusive, as the man stated that it was not the most potent agent he was in the habit of using, nor, indeed, should I consider any single trial as proof either for or against the good effects of the drug, however it had resulted. Many and repeated experiments are necessary before any definite opinion can be formed on so important a subject, and, therefore, before recording one it is expedient that the experiments should be made again; and as Col. Showers has expressed a wish that the man should have further opportunity of exhibiting his antidote, I think that, on a future occasion, more certain results may be obtained.

Having studied the effects of the poison in many animals, and having formed conclusions as to the nature of the cause of death, I am sceptical on the subject of antidotes, and fear that the hopes of those who are most sanguine on the subject will not be realized. I am not the less anxious, though, to become acquainted with whatever may be of service in the treatment of snake-bites, whether prophylactic or therapeutic; and I shall be glad to record any facts that tend to throw light on the subject, as to admit the potency of an antidote when I see it proved. Col. Showers informs me that the kelaree makes the following objections to the experiment:—1st, that he was not fully prepared; 2ndly, that the antidote was not the most reliable one he knows of; 3rdly, that the animal was bitten three times by the cobra.

With reference to these I would remark, that the time for the experiment was appointed some days previously; that he was invited to make any previous preparation he thought desirable; that the room in which the experiments were performed was placed at his disposal, and that certain snakes were also made over to him; that he locked himself in for some time the day before making his preparations; and that Mr. Sceva was most careful to see that all he wanted was procured, and all his wishes carried out on the day of the experiment. The animal bitten was placed at his disposal to do what he liked with, and all his wishes were complied with to the minutest details. If, therefore, anything were wanting the fault was his own.

Secondly. With reference to the antidote itself, it was suggested by himself, and he certainly expressed his belief that it would prove efficacious; or else why did he administer it?

As to the number of times the dog was bitten by the cobra, the snake was made to close its jaws in three places to insure the injection of the poison; the first bite, at least, being doubtful. I am quite satisfied that one bite, had it been fairly inflicted, would have been sufficient: nor does the fact of there having been three punctures affect the question in this instance, for nothing occurred to show that the dog was in any way influenced by the so-called antidote: it succumbed with the same symptoms, and in about the same time, as other dogs that had not taken any antidote at all, and were bitten in the same way by a cobra.

The efficiency of the antidotes described by Col. Showers shall be fully tested whenever the man who administers them declares himself to be ready and fully prepared.

Experiment, No. 2.—At 12.13 P.M. a kid of about three or four months old was bitten three times in the hind leg by the same cobra that bit the dog in the previous experiment. The object was, that in the event of the poison not taking effect on the dog, the activity of the poison might be demonstrated by its action on the kid: this, had the dog survived, would have been so far confirmative of the efficacy of the antidote.

" 12.15. Leg weak; partially paralyzed.

" 12.16. Bleating; staggers, but walks; lies down; defacation.

" 12.20. Can stand, but the bitten limb is paralyzed.

" 12.25. Almost paralyzed; convulsed.

" 12.29. Convulsed.

" 12.34. Heart beats 96 per minute; respiration almost gone; eyes glazed; pupils dilated, insensible to light.

" 12.36. Death. Heart beat for two minutes after respiration had ceased.

" Bitten at 12.13; dead at 12.36. Death in twenty-three minutes."

The activity of the poison had no doubt been exhausted by the previous biting of the dog, otherwise a young animal like the kid would have probably succumbed more rapidly.—'*Indian Medical Gazette*' *for February*, 1869.

Amongst the antidotes—or, at least, those reputed to be such—is the plant called by the natives in the N.W. Provinces, the nervissa (*Aristolachia Indica*). This plant grows as a creeper, and the patient is made to chew the leaves, from which also a decoction is made and administered: I grew the plant at Manipuri, and tried its efficacy, but without avail.

A friend of mine writes me that he grew it at Multan, and that a man, whom he made chew the leaves after having been bitten by a cobra, came round; but then, he added significantly, "he must admit he also gave him eau-de-luce;" and thus it is, it appears to me, in many of the cures the reputed antidotes have been supplemented by stimulant treatment and constant exercising of the patient, by which latter methods alone the man has been cured.

In order to show the English reader what snakes we commonly meet with in India, as also that the Government does its best to inform its dependents, I will here quote a list of the venomous snakes as found in the Punjab, from the 'Punjab Government Gazette.' I am not aware that any such list has been published in the three Presidencies: the matter has evidently been taken from Dr. Günther's work on the Indian Snakes:—

"The first mentioned belong to what are called Colubrine Snakes, having the general form and appearance of ordinary harmless snakes, as opposed to the vipers which form the other division. They are classed by Günther, in his catalogue of snakes in the British Museum, under the name of Elapidæ; have the venom fang grooved, with or without two or three teeth behind it, but never in front of it in the upper jaw; the head is not sensibly thicker than the neck, and is covered above with moderate-sized or large plates; the scales in general are smooth.

1. NAIA TRIPUDIANS—the cobra, figured by Russell in his 'Indian Serpents,' part 1, plates 5 and 6; *cobra-di-capella* (Portuguese), *i.e.*, the "hooded snake"; *nag* or *nag samp* (Sanscrit and Hindustani), in the south of India; *keoutia* (Bengali), also *gokhura*, *i.e.*, "cow hoof."

Several of the numerous varieties of this snake have received distinct native names, but it is not necessary to give these here. This snake is too well known to require any detailed description: the genus Naia comprises those snakes that, to the general character of the Elapidæ given above, adds that of a distensible neck, the cervical ribs being lengthened, and the hood thus formed bears on its upper surface the well-known mark of a pair of spectacles, hence sometimes called the "spectacle snake." It varies very much in colour, some being pale brown, others dark brown, others nearly black, and some purplish brown. The snake-charmers give various names to these varieties, some of which, however, are quite local; and Mr. Lesson has also given a distinct specific name to one variety. The spectacle mark is in general most distinct in the pale-coloured varieties; less so in the black. The number of rows of scales on the body varies from nineteen to twenty-three; the large abdominal scutæ or shields from the chin to the vent from 180 to 190; and the subcaudal shields from the vent to the end of the tail, which are in a double row, from fifty to sixty—more or less. The celebrated asp of Egypt (Cleopatra's adder) is the only other known species of cobra.

2. BUNGARUS LINEATUS. The "karait," popularly of Europeans, figured by Russell, part 1, plate 1; said to be called *karait* and *kalla karetta* in some parts; *kulcha* of snake-men in Calcutta; also called *keoutia* by many; *tirkheca* at Sangor.

The genus Bungarus is similarly formed to the cobra; but the subcaudal plates, or those under the tail from the vent, are in a single row. The poison-fangs are not very large, and have a few smaller teeth behind them, but none in front. This species, which is perhaps the most common venomous snake throughout all India, is found equally in barren plains and well-wooded country: it attains the length of four feet or perhaps a trifle more occasionally, but is rarely met with so large. The head is barely thicker than the neck: there are fifteen rows of scales on the body; the abdominal shields from the chin to the vent are about two hundred, and there are forty or so single ones under the tail. The colour is a dull black with narrow white cross bands, very distinct when young but almost obliterated in old snakes; the belly is white.

There are one or two harmless snakes belonging to the genus Lycodon, very similar in colour to the karait and often mistaken for it: these can be readily distinguished by having two rows of shields under the tail, as well as by the presence in the harmless snakes of teeth in front of the upper jaw.

The next snake belongs to the viperidæ, or Viper family, distinguished by having only the fang (which is usually very long) in the upper jaw: this folds back when the mouth is shut, or the snake quiescent; but can be raised at the will of the animal, and is perforated for the passage of venom. The head is large, flattened, and usually covered with small scales; the neck is thin, the body thick and massive, and the tail is short; the scales are usually ridged or keeled.

3. DABOIA ELEGANS. *Vipera Russellii,* Shaw. *Bora* and *chokera bora* (Bengali); *katroll* of some Calcutta snake-men; *khasa bora* of some; *dhiyur* (Hindusthani) in some parts; *coonj chari* at Sangor; *cobra monil* of the Portuguese. Figured by Russell, part 1, plate 7.

This viper is what every one would, at first sight, call an ugly-looking snake. The head is large and somewhat triangular, covered with small scales; the neck is a good deal thinner than the head or body, which last is thick and massive; the tail is short; its fangs are of great length. The colour of the adult is a dirty olive-brown, with a triple series of dark rings, the centre one on the median line of the bark joined together like the links of a chain; hence called cobra monil (Latin, *monile*) by the Portuguese. When young the colours are more vivid, the brown richer and more chestnut in tint, and the dark rings more distinct: it has twenty-nine to thirty-one rows of keeled scales on the body; the abdominal plates vary in number from 160 to 170, more or less; and those under the tail from fifty to sixty: it grows to the size of four and a half feet and upwards.

4. ECHIS GARMINA. Figured in Russell's "Indian Serpents," part 1, plate 2, and called *katrool* by the snake-men.

This is a second species of viper, very similar in form to the last; common in Madras, in Central India, and the North-West Provinces, but has not yet been found in Lower Bengal. It is a small snake, rarely exceeding eighteen or twenty inches, of a pale brown colour with some white rings: its abdominal shields number about one hundred and fifty, and its subcaudal about thirty, more or less. I have never heard of this venomous snake causing death to any one bitten, and I have known dogs to recover from its bite.

Experiments on the Influence of Snake-Poison—made by J. Fayrer, M.D., chiefly with reference to Professor Halford's remarks, based upon his experiments in Australia relative to the effect on the blood-corpuscle. This paper had not been seen by me when I wrote the note which is appended to Professor Halford's remarks, and which was suggested as there stated by a paper on the subject of blood-corpuscle in 'Scientific Opinion.' The examination of objects under the microscope, as I know from experience, is not so easy as is generally imagined, and any delay in mounting so delicate an object as a blood-corpuscle is fatal to accuracy of observation. With these remarks I will quote the experiments of Dr. Fayrer, which were recorded in the 'Indian Medical Gazette' for December, 1868:—

"The following experiments are the latest that Dr. Fayrer has made in continuing his splendid series of researches on this important subject:—

"*Experiment, No.* 1.—15th October. A fish (Ophiocephalus marulius), about ten inches in length, was bitten by a fresh cobra at 11.20 A.M. in two places, on the dorsal and ventral surfaces. At 11.22 the fish turned over on its side in the water; at 11.23 struggling and plunging violently in the water; at 11.25 turned over on its side; at 11.26, on being roused, plunged violently; at 11.40 dead. Bitten at 11.20; died at 11.40. Dead in twenty minutes.

"*Experiment, No.* 2.—A large snail (Achatina fulica) was bitten at 11.28 by a cobra; it immediately withdrew itself within its shell. At 11.45, in order to examine its condition, the shell was broken; it still continued to contract. At 12 no contraction; all irritability seemed extinct. Dead.

"*Experiment, No.* 3.—Two snails of equal size, shells previously broken; one was bitten by a cobra at 12.28; it immediately shrank, and contracted itself. The other snail was not bitten, and was kept for comparison. At 12.40 irritability of the bitten snail much diminished. The bitten snail seemed to lose its vitality much sooner than the uninjured one; but the precise time when irritability ceased was not noted. These were the only invertebrate animals I could procure on this occasion. The experiments, though not very satisfactory, leave no doubt that the mollusk was affected by the poison.

"*Experiment, No.* 4.—A fully-grown cobra was bitten at 11.40 A.M. in two places near the tail, by Daboia Russelli; at 11.48 no effect; 12.50 no effect. October 10th (20th?), 8 P.M., the snake was perhaps not so lively, but there was no marked effect, and it lived.

"*Experiment, No.* 5.—A fully-grown cobra was bitten in two places, on the ventral surface and the middle of the body, by a daboia, at 11.58. Up to 12.50 no effect; 16th October, 8 P.M., no effect; the snake lived.

"*Experiment, No.* 6.—A half-grown chicken was bitten by a fresh cobra in the thigh at 12.2; at 12 3′ 45″ it crouched; head drooping, beak resting on the ground. At 12 4′ 30″ paralyzed, head lying on the ground; at 12.5 convulsed; at 12 5′ 10″ dead, *i. e.*, in three minutes and ten seconds.

"*Experiment, No.* 7.—A second chicken was bitten by the same cobra at 12 9′ 30″ on the thigh; at 12.10 leg partially paralyzed; at 12.13 lying down, beak resting on the ground; at 12 13′ 30″ paralyzed, beak resting on its point on the ground; at 12.14 convulsed. Dead in five minutes and thirty seconds.

"*Experiment, No.* 8.—A third chicken was bitten by the same cobra in the thigh at 12 17′ 30″; at 12 18′ 30″ it fell over, rested the point of its beak on the ground; at 12.19 convulsed; at 12.21 dead, in four and a half minutes. This chicken was rather smaller than the two preceding ones. These three experiments show that the snake had lost but little of its power in three efforts: the cobra used in these experiments was not fully grown, but it was very active and vicious.

"*Experiment, No.* 9.—The above small cobra was bitten at 12.35 in two places, in the middle of its body and on the ventral surface, by a large and fresh cobra. October 16th, 8 P.M., not affected; it lived.

"*Experiment, No.* 10.—October 19th, 11.40 A.M., a large dhamin (*Ptyas mucosus*) was bitten in two places by a daboia; at 11.47 is partially paralyzed; the mouth is wide open; appears unable to move; respiration continues; at 11.49 moving slowly about; at 11.52 appears to be recovering; at 12 more active. October 20th, 6 A.M., appears sluggish; at 10 A.M., on being roused, moves slowly, but is weak and stiff. Recovered subsequently. October 26th, 12 47′1″ bitten again by another daboia; at 1 P.M. no effect; became sluggish and died at 10.40 P.M. on October 27th."

On the 26th October a number of other experiments were made with the view of again carefully examining the blood-surface before and after the snake-bite: the blood was very carefully examined on three occasions:—1st, before the animal was bitten; 2nd, whilst it was under the influence of the poison; 3rd, after death. In no case was anything found to support Professor Halford's theory, or to confirm his observations. There was no appearance of any new corpuscle, nor was there any change of importance in the condition of either the red or white globules of the blood. My impressions were in favour of the theory advocated by Professor Halford, and if any bias existed it was certainly for, rather than against, the explanation he gives of the pathological changes in the blood. Nothing, however, that I have seen, after many observations, supports the view in question; and I am constrained to believe that the change in the blood is of a much more subtle character than can be detected by the microscope. Moreover, in rapid death, as for example, when it occurs in from thirty to forty seconds, it is impossible that such developmental changes could have taken place. The cause of death is evidently an impression made on the nerve centres through the medium of the circulation; but it is, I think, evident also that it is one of a dynamical nature, and not immediately dependent on any structural changes that may, if any do, occur in the blood, and can be seen with the microscope. When death is protracted, and the venom has thus time to set up blood changes, as in the case of zymotic poisoning, I can well imagine that the blood, as such, becomes unfitted for the purposes of life, and that death results in consequence of these changes; but I have not as yet seen anything to confirm this view of the cause of death, nor do the post-mortem appearances show that it is due to asphyxia, from pulmonary congestion or embarrassment. I do not, however, positively assert that such is not the case; I merely record the fact that, up to the present time, I have been unable to discover the blood changes discovered by Professor Halford: further investigations may lead me to a different opinion.

Experiments on Snake-Poison, by Dr. Fayrer, M.D., Calcutta.—"I am indebted to Messrs. Greenhill and Rutherford, Veterinary-Surgeons, for the opportunity of making the following experiments:—

"The horses experimented on had been condemned to be destroyed for the disease, partial paraplegia ("gone in the loins"), and were placed at my disposal by the above gentlemen, for whose valuable aid in noticing the symptoms and recording the pathological conditions I am under much obligation. The disease, though incapacitating the animal for work, is not such as to reduce his strength so much as to vitiate the evidence derived from the effects upon him of the poison; and I believe these experiments may be accepted as fair illustrations of the action of snake-poison on the larger animals. The subjects experimented on were a stud bred mare about 14 hands 3 in. high, and aged twenty-seven years, suffering from partial paraplegia, and an Australian horse, 15 hands 1 in. high, nine years old, a powerful animal and in good condition, although also paraplegic. The mare succumbed in an hour and twenty minutes, from the effects of the bite of a large cobra, whilst the younger and stronger horse survived the bite of a powerful, fresh and full-grown daboia nearly twelve hours.

"The difference in the effects of the poison of the daboia and cobra in these two cases is very remarkable, not only as to the duration of life in the animals bitten, but also in the pathological conditions before and after death. The mare bitten by the cobra was rapidly affected—staggered, became exhausted, and died in less than an hour and a half. The post-mortem examination showed distinct rigor mortis, firm coagulation of the blood; the heart and large vessels, aorta as well as venæ cavæ, distended by firm ante and post-mortem coagula. The lungs were very slightly congested, frothy when cut into, and on the anterior snrface rather pale and bloodless than the reverse, whilst all the abdominal viscera were equally free from congestion. The horse bitten by the daboia, on the other hand, was affected very slowly, and seemed to doze his life away until just at the last, when a few unconscious plunges terminated his existence: the post-mortem examination in this case showed less cadaveric rigidity, fluid blood, empty cardiac cavities, and lungs and other viscera congested. But it is to be noted that the cobra bit more vigorously, forced his fangs deeper, and had to deal with a more feeble animal than the daboia, who bit a more powerful and healthy horse, and did not insert his teeth with such vigour as the cobra. The snakes were both fresh and fully grown, and their terrible power was strikingly illustrated by the death of these two horses.

"The difference observed in the pathological appearances and state of the blood after death may probably be accounted for by the greater rapidity of death in one case, rather than by any essential difference in the nature of the action of the poisons: the mare bitten by the cobra died in eighty minutes, and after death the blood coagulated firmly, and was found distending the heart and great vessels with firm coagula. Death was probably caused by the rapid effects of the poison on the nerve centres before the blood had time to be thoroughly devitalized. In the other case, where death did not occur for nearly twelve hours, there was no coagulation either in or out of the heart or vessels; sufficient time had elapsed to allow the blood to be thus thoroughly changed. I am inclined to believe that if death were protracted after a cobra bite, the condition of the blood would be as it was in the case of the daboia bite."—'*Indian Medical Gazette*' *for November*, 1868.

C. Horne.

3, Bernard Villas, Upper Norwood.

Ornithological Notes from North Lincolnshire.

By JOHN CORDEAUX, Esq.

(Continued from S. S. 1841).

AUGUST AND SEPTEMBER, 1869.

Kingfisher.—Where do all the kingfishers, so plentiful at this season in the marshes, come from? This year they are abundant, and I have seen three on the wing together: there is no doubt we have considerable arrivals of these brilliant living gems during the last week in July to the first week in August inclusive: for years I have observed how numerous they become about this time, and since few breed in this district—none, as I am aware, in the marsh—this large increase during the latter summer must be consequent on arrivals from the northern countries on the Continent; if the latter, they are—excepting, perhaps, the whimbrel — the first migrants to arrive on our shores, the advanced guard of the great bird army. But where do they come from? This species, according to Mr. Wheelwright, has never been detected breeding in Scandinavia, and is but sparingly dispersed over Denmark; consequently, if continental birds, the migration must be due from the coast of Holland, and they would thus naturally arrive on our eastern coast. I scarcely think they are wanderers from our more northern counties, as the sudden disappearance of the broods from their summer haunts could not fail ere this to have been noticed and recorded. A few, very few, of these arrivals remain for the winter, the greater part leaving before autumn floods and storms.

Brownheaded Gull.—August 23. I have more than once remarked, in former volumes of the 'Zoologist,' on the habit these gulls have of hawking for the crane-fly. I had again, this afternoon, the pleasure of seeing my favourite gulls capturing insects on the wing, hovering with a curious see-saw motion over one of the marsh pastures. I took some pains to estimate the number of gulls that were at work over this field (50 acres), and by counting, as near as was possible, the birds over one section of the pasture, judged that there were altogether certainly not less than six hundred. It was not this time, however, the crane-fly they were pursuing, but winged swarms of black ants, infinite myriads of which filled the air. I have seen nothing like it before, and feel how utterly hopeless it is to give any correct idea of their number—sometimes they had the appearance of a gray mist, or scud, drifting across the marsh: it was as if all the ants in the country had followed the prevailing fashion and gone to the sea-side. My clothes were soon covered, and hundreds became entangled in the mane of my horse: these were of two sizes, from that of the common ant to others four times the bulk (probably the females); all were very dark brown or black, with the extremity of the abdomen a shade lighter.

Lapwing.—August 25. We have now some considerable flocks in the marsh: their principal rendezvous is at present the turnip fields; they also went at low water to the mud-flats. This is, however, an unusual circumstance, and I never knew them do so unless in a lengthened period of hot dry weather.

Whimbrel.—August 25. The heat to-day was excessive; the very cattle were oppressed by it, and there was not a breath of wind to temper the fiery glow. Several times during the day I heard far up—very far up—in the cool thin atmosphere the familiar call of whimbrel, but only once distinguished the passing flock: they were mere specks, a string of about thirty flying *en échelon.* Whimbrel have now passed over this village, going southward, more or less frequently since the middle of July: they usually fly at an immense height.

Rook (variety).—There is a curiously marked rook in this neighbourhood: the peculiarity is in the wings: in each there is a single white secondary quill, the remainder of the plumage being of the ordinary colour.

Wild Duck (A. boschas, variety).—A wild duck (female), which I shot this morning, Sept. 1st, in the marshes, differs from the ordinary type in having the general plumage some shades darker: on the lower neck and a portion of the breast there is, in singular contrast to the rest of the plumage, a very perfectly formed crescent-shaped patch of a pure white: the concave side is uppermost, the horns running up to a point on each side of the neck. I have seen some of the "foreign" ducks, mentioned in the 'Zoologist' (S.S. 1737), marked exactly in the same manner.

Knot.—September 8. Shot two out of a small flock on the flats this afternoon. I had no difficulty in getting within easy range. Neither of my specimens is in the complete winter dress: the under parts in both are dashed with a pale reddish buff, more conspicuously on the flanks and chest.

Redshank.—September 10. First arrival; five seen on the mud-flats.

Gray Plover.—September 10. Heard calling on the flats.

Swift.—September 18. Last appearance; a single bird seen.

Thrush.—September 20.—Thrushes are now plentiful in our turnip fields, and keep rising before the dogs, to the no small annoyance of nervous sportsmen.

Lesser Blackbacked Gull.—This species is now common on the flats: it is not with us a resident species, and is seldom seen except during the autumn. Before rain or wind these gulls are very noisy, and tower, flying round and round in circles, much after the manner of the brown head. Their cry is extremely hoarse, somewhat resembling that of the wild goose, but is not nearly so musical.

Starling.—There are some old ash trees in one of my hedgerows thickly covered with gray lichens. I observed a flock of starlings this morning flying about them and settling on the trunks and larger limbs, clinging to the rough bark like so many woodpeckers: there was a good deal of lichen scattered on the ground, and on examining these trees I found beneath their gray covering a small white grub, not unlike a cheese-maggot, but larger. There are also many long-legged spiders in the interstices of the bark.

Hybrid Wild Duck.—September 23. I killed a dark-looking duck from the beck this morning, which I cannot identify: I think it probably either a hybrid between the common A. boschas and the American dusky duck, A. obscura; or between the common wild species and one of the foreign birds previously alluded to—some of which I have good reason for thinking have gone wild in this district. The following description was taken the same evening:—

Male.—Length over all 23½ inches.
„ of bill 2¼ „ from angle of forehead along ridge.
„ of tarsus 1 7/20 inch.
„ of wing from flexure, 11¼ inches.
Expanse of wings, 33½ inches.
Weight 2½ lbs., rather over.

Second quill longest; third shorter than first; bill greenish yellow, darker along ridge; nail black. Feet larger and coarser than those of the mallard, reddish yellow, webs darker. Tail of eighteen acute feathers, none recurved. Top of head and little lower than eyes dark brown, nearly black, shot with drake-green. On the lower neck there is a white collar, which does not extend to the back of the neck; there is also a white spot on chin. The remainder of the plumage is blackish brown, the feathers more or less margined with a lighter brown; in some cases almost a reddish brown. On the breast and belly the feathers are mixed with others which are gray, finely undulated—indeed, exactly what we see in the mallard. On the lower back and upper tail-coverts the edges of the feathers have a distinct dark greenish gloss. The under tail-coverts are mixed, part dark-brown with a lighter edge, the rest dark bluish green. Tail uniform dusky; greater and lesser wing-coverts dusky gray, with a faint greenish gloss. Ten of the secondary quills with their outer webs violet, purple, or bluish green, according to light; under wing-coverts and axillaries dusky grey. This bird rose in silence, flew rapidly, and was extremely wild and shy: it was a long way out of shot when first flushed; but I marked it drop some distance down the beck, where I afterwards shot it.

September 27. First woodcock seen.

JOHN CORDEAUX.

Great Cotes, Ulceby, Lincolnshire,
September 30, 1869.

Ornithological Notes from Norfolk—January to September, 1869.

By HENRY STEVENSON, Esq., F.L.S.

(Continued from S. S. 1496.)

JANUARY.

Goosander.—Between the 1st of January and the 9th of February six fine birds, four males and two females, in adult plumage, were killed, out of a flock of about sixteen, on Lord Suffield's lake at Gunton, near Cromer. These birds usually make their appearance on the water, with other wild fowl, in October or November, but are not easily accessible, and seldom exceed eight or ten in number.

Wild-fowl.—On the 30th, after a few days' severe frost, the following birds appeared for sale in the Norwich market:—two immature male goldeneye ducks, two immature male smews, several fine adult tufted ducks and pochards, wild duck and mallard, two immature red-throated divers and about two hundred dunlins, all from the neighbourhood of Wells and Blakeney. An adult male smew was killed at Hockwold, about the same date, and another seen.

Little Gull.—An immature specimen shot at Yarmouth, about the 24th.

Roughlegged Buzzard.—An immature bird killed at Rollesby, on the 23rd.

Sea Eagle.—On the 25th, as a son of the Rev. A. Pyne, of Horning, was walking in a field near his house, in pursuit of a hen pheasant which he had just seen alight there, the pheasant suddenly squatted, and instantly a large bird of prey swooped over the gunner's head and carried off the pheasant from the ground. Mr. Pyne did not fire, as his father is desirous of having such birds preserved, but he had no doubt as to its being an eagle, from the view he had of it when passing close over him.

Shoveller and Longtailed Ducks, &c.—On the 23rd a fine adult male shoveller was shot at Rollesby. On the 17th a nearly adult male of the longtailed duck (scarce), at Lynn; and an adult male merganser, at the same place, on the 13th.

Wild Swan.—Two hoopers shot in the estuary at Lynn, on the 24th, out of a flock of five.

Peregrine.—On the 11th a falcon of this species was seen by John Gally, the gamekeeper at Northrepps, near Cromer, chasing one of the green parrots, which are there kept at large in the grounds of Lady Buxton. Both birds ascended to a great height, till he lost sight of them, going towards Felbrigg.

FEBRUARY.

Sclavonian Grebe.—A bird, in winter plumage, was killed about the 6th near Yarmouth, and another on the 28th.

Velvet Scoter.—A fine adult male shot off Hunstanton beach.

MARCH.

Greenfinch.—Large flocks of these birds have appeared lately. On the 16th I saw more than a dozen hanging up in bunches at a poulterer's shop, *all adult males.*

Dipper.—On the 17th a single example of this bird was shot at Buxton Mills, and sent, in the flesh, to the Norwich Museum. Like all preceding Norfolk-killed specimens that I have seen, this has the black breast of the Lapland race.

Crossbill.—A large flock seen at Northrepps, near Cromer, on the 16th, and a small flock on the 20th.

Puffin.—An immature bird, with small bill but slightly grooved and dark-coloured cheeks, sent me from Salthouse on the 15th. An immature male was shot at Wells on the 26th.

Shoveller and Pintail Ducks.—A pair of shovellers killed at Lynn on the 1st, and an adult male on the 22nd; also a pair of pintails, at Babingley, on the 1st.

Ruddy Sheldrake.—An adult male shot at Snettisham, on the 26th, as recorded in the 'Field,' &c., at the time, proved to be a foreign specimen escaped from confinement.

Merlin.—An adult male was caught alive in a singular manner, on the 14th, at Swardestone, near Norwich. The hawk was seen by a lad to dash after a small bird, which was flying towards an oak tree for safety. Oddly enough the merlin so entangled itself in the branches, some twenty feet from the ground, that the boy climbed up and caught it, in spite of its determined attacks upon his fingers. The bird, only slightly injured in the wing, is still alive.

APRIL.

Redthroated Diver.—A fine adult bird, with good red throat, was shot about the 2nd of this month.

Shoveller Duck.—An adult pair, but unusually small, were shot near Lynn, on the 19th.

Montagu's Harrier.—An adult female killed at Northrepps, near Cromer, on the 25th.

MAY.

Blacktailed Godwit.—An immature bird killed at Hickling on the 8th.

Crane.—To the interesting account, by Mr. J. H. Gurney, jun. (S. S. 1841), of the cranes killed this spring in Norfolk and other localities, I need only add, that the bird killed in Manham salt-marshes, on the 25th of May, proved to be a young female. The man who captured it kept it in confinement till the 5th of June, when it died and was stuffed for the Lynn Museum. It was fed on whelks, worms and mussels. The young male shot at South Pickenham, on the 4th of June, had several white worms, about three inches long, in the stomach; also pebbles and small white Mollusca, about the size of peas.

Rook.—A pair of rooks from a small colony which nest in the trees of Swaffham church-yard attempted to build on a gurgoile, or stone-head, projecting under the eaves on one side of the church, but the sticks and other materials were constantly stolen by their companions, and they gave up the attempt. This strikes me as a very unusual circumstance with this species.

Blackcap Warbler.—A nest of this species, with two eggs, was found, on the 1st, in a garden at Reepham. When first seen the male, or black-headed bird, was sitting. The next day the female, or brown-headed bird, was on the eggs.

Tufted Duck, &c.—I saw two ducks of this species on Hoveton Broad on the 17th of May; they had been unusually plentiful there throughout the winter. The keeper assured me that he had seen one or two last year as late as June. Wigeon were still on those waters this year up to the first week in May, and a bittern was heard there on the 16th.

Harriers.—Several very fine examples of our three species of harriers were killed this month in different parts of the county. On the 13th I had two immature hen harriers, male and female, and an adult male of Montagu's harrier, killed at Hickling. On the 22nd another adult male Montagu's harrier, also from Hickling, and a very old male marsh harrier, shot off a tree in Catton Park, near Norwich. The secondary quills and greater wing-coverts in this bird were very gray, and the tail-coverts more gray than brown. The crown of the head was dirty white, streaked with brown; the breast and under parts generally bright chesnut. Another marsh harrier, immature, with straw-coloured head, was shot at Hickling, about the same date. On the 20th of May an adult male of Montagu's harrier was killed at Somerton, near Yarmouth; and on the 24th an immature female of that species, in the same neighbourhood. The latter had a nestling thrush in its stomach.

Hawfinch.—A pair of these birds, I regret to say, were shot at Brooke, near Norwich, on the 14th. The female contained three eggs nearly ready for exclusion.

Great Spotted Woodpecker.—A pair shot at Bawdeswell, on the 19th. The female contained eggs, but small.

Kentish Plover, &c.—May 27. I was shown to-day, in the flesh, an adult male of the Kentish plover, rare in any plumage on our coast, also a black tern; both killed at Yarmouth.

Golden Oriole.—An adult female was killed at Brooke, about the 28th of May: the largest eggs were about the size of hemp-seeds.

Turtle Dove.—These birds, which of late years have visited us in greatly increased numbers and nest abundantly in our fir-plantations, have been more than usually numerous this summer.

Turnstone.—A fine pair shot at Cley, on the 30th, in nearly full summer plumage, and another pair on the 3rd of June.

JUNE.

Hawfinch.—On the 22nd an adult male of this species was shot near Norwich. The stomach contained green peas and larvæ of the currant moth.

Hobby.—An adult male shot at Somerton, near Yarmouth, on the 19th, had the remains of a sky lark in its stomach.

JULY.

Hen Harrier.—An immature hen harrier shot at Hainford, on the 3rd.

Kestrel.—The Rev. J. Burroughes informs me that early this month a nest containing seven young kestrels was taken out of the bell-turret of Brandall Church, near Norwich. He has seen most of the nestlings in the village.

Sky Lark.—From the same informant I also learn the following curious fact. A nest of sky larks having been brought up by hand at the Thorpe Lunatic Asylum, near Norwich, where different birds are kept to amuse the patients, a second batch of nestlings was taken, and being placed near the first were entirely fed by them, as also a third batch of nestlings taken a few weeks later.

Little Stint.—A bird, in full summer plumage, was shot at Yarmouth on the 16th, and two others about a week before.

AUGUST.

Shoveller and Garganey Ducks.—Saw a female shoveller, which by her actions appeared to have young ones close by, and a pair of garganey teals, at Longmere and Foulmere, on Wretham Heath, near Thetford.

Land Rail.—An unusual number of these birds appear to be scattered over the county, in localities favourable for them.

Hooded Crow.—I have recently seen three hooded crows, killed on Mr. Fowler's estate at Ganton, near Lowestoft, in Suffolk. Respecting these birds Mr. G. G. Fowler writes me that a pair have been seen about there all the summer, and on the 29th of July three were seen together, but all apparently of the same age. One was observed to have some difficulty in flying, and may have remained through an injury. Since these three were shot another had been seen. The three I have examined are certainly all old birds, and if one may judge by the almost bleached look of the gray portions of the plumage, are probably very old birds. Did the infirmities of age induce these venerable crows to give up the perils of migration, with an eye to the eggs of pheasant and partridge instead of grouse?

Eagle Owl.—The bird stated by Mr. Tegetmeier, in the 'Field' of September 11th, to have been shot wild in Norfolk, was a young bird of the year, escaped from confinement at Northrepps, near Cromer. See 'Field' of September 18th.

HENRY STEVENSON.

The Death's Head and the Bees. By the Rev. CHARLES BURY, M.A.

I HAVE been a keeper of bees from my youth upwards, and I have expended some thought, and a little money, in trying to establish an improved system of bee management for my poorer neighbours—a system at once practicable and profitable, within the compass of their pocket and of their intellect.

Now I have read, as has everyone else at all conversant with apiarian literature, in connexion with bees, of certain remarkable doings of the death's head moth (*Acherontia Atropos*), of its love of honey in the general, and of its boldness in particular in entering the hives and regaling itself uninvited on the stores laid up therein by the bees for their own and their master's benefit. I have read, too, that on the bees assailing the intruder, he or she, as the case may be,—*i.e.* the moth,—has the tact to utter certain sounds so nearly resembling those emitted under some circumstances by the queen bee, that upon the utterance thereof the angry assailants immediately fall back and allow this bold usurper of their sovereign's voice to leave the hive without further molestation, after satisfying itself with a fabulous quantity of honey. Now as this remarkable proceeding is stated as a fact, known of their own knowledge by men of veracity and careful observation, it was not for me or the like of me to doubt its correctness. Nevertheless it is always pleasant to verify in one's own experience the observations and statements of others; and so, if I have had that satisfaction, at least in part, it may be also satisfactory to your readers to be able to add to the list of authorities upon the subject the name of an old contributor to the pages of the 'Zoologist.'

Be it known, then, to all who care to know it, that my bee-hives—at least some of them—occupy a sort of balcony just outside the window of my study, situated on the first floor; and as I sit at my open window the busy hum of my industrious little neighbours sounds pleasantly. Well, on the 15th of June, I resolved to what is called technically—*i. e.* in beemaster's language—"raise" one of these hives, which was crowded with bees, but seemed indisposed to swarm. The process of *raising* consists, as some of the readers of the 'Zoologist' possibly may not know, in placing a flat-topped hive beneath the stock, with a connexion between them. To effect this I had to mount a ladder and face the bees—not exactly the safest or pleasantest position! I succeeded, but the bees were not well pleased, and poured out in a continuous stream, covering the entire front of the hive. Few took wing, for it was evening twilight. While watching their proceedings from the ladder something so like a bat flitted round that it did not attract my particular notice; but on going up into my study I leaned my head out of the window to within a foot of the entrance of the hive, and I then saw what I could not fail to recognize as a death's head moth flit backwards and forwards once or twice before the hive, dash at the entrance, penetrate the cluster of bees and disappear within! I leave to apiarians, entomologists, *et hoc genus omne*, to imagine my surprise and pleasure. But what was to be done? I had nought save a small net intended for landing trout, not catching moths, to aid me in the capture; so rigging it out I waited anxiously with net in close proximity to the hive to intercept the intruder on his egress. In about five minutes out she (for it is a female) came in no small bustle, and as I thought I could distinguish, but it was almost dark, with five or six bees attached to her legs. Instead of taking wing the moth scrambled, fast enough, over the cluster of bees to the top of the hive, and my net was instantly upon her. The bag of the net, however, fell over the cluster, and though I had the moth safely within, I had also within and without and hanging among the meshes some hundreds of bees. The consequence was I could neither catch the moth with my fingers nor bring the net into my room; and after running round and round with marvellous celerity my prisoner effected her escape: she was off like a shot. Next evening I kept watch and ward for my friend Atropos: she appeared, dashed against the window, and I saw her no more.

Now, I have to add, certain sounds, which I should best describe as a rather musical squeak, I distinctly heard, apparently from within the hive; but whether those sounds at all resembled the notes, real or imagined, of the queen bee, I cannot tell, never having succeeded in catching the sounds attributed by others to her apiarian majesty.

Now for the sequel: this morning (2nd of October) I was arranging a piece of carpeting, with which the above-mentioned hive had been covered all the summer as a protection from rain, when, lo! between the folds, sleeping, it may be, the unquiet sleep of satiety, there lay my friend—at least a moth of the same species; and, inasmuch as the perfect insect is by no means common with us, I have little doubt of her personal identity. It is the finest British specimen I ever set eyes on. As it has never been seen flying about since the 16th of June, I more than suspect I have afforded this dear lover of honey lodging as well as board all these months; in fact, that my lodger descended every evening, resorted to the stores within the hive, made a hearty supper, and then quietly went up to bed again in the old carpet.

I will just add, that in captivity this moth on being touched emitted sounds, feeble but distinctly heard by sharp ears, corresponding with those I heard from the interior of the hive in the summer.

CHARLES A. BURY.

Rhinoceros Horn toppling forward, &c.—Visitors to the Zoological Gardens, Regent's Park, are likely to have remarked how very much the long single horn of the old female Rhinoceros indicus inclines forward, as a consequence of its own weight and of the attachment of it merely to the skin, so that it is movable to a considerable extent. This circumstance is at once suggestive of the idea entertained by the South African traveller Chapman and others, that the alleged Rhinoceros Oswellii is no other than an old and very long-horned example of R. simus, with its anterior horn inclining forward in like manner. I shall not be greatly surprised if, in one of her moods of violence, the female rhinoceros at the Gardens detaches her horn from the skin, as happened three or four years ago with an animal of the same species at Moscow, the horn of which is now preserved in the museum of that city, while the creature has developed another horn in its place. That the horn of a rhinoceros, which consists merely of agglutinated hair, is liable to be occasionally thus shed (or rather knocked off), occurred to me many years ago on my obtaining the facial portion of the skull, with the skin and two horns attached to it, of an old male of R. sumatranus. From the small size of its horns, I at first supposed the animal to have been adolescent; but, upon maceration of the specimen and removal of the skin, it was at once perceived, from the complete anchylosis of the facial bones, that the animal must have been considerably aged, and the idea at once occurred to me that its first horns must have been cast or shed, and that others had been developed in their places. If the forehead be examined of the old female rhinoceros in the Regent's Park, it will be perceived that there is a considerable excrescence in the centre of it, which is no other than a diminutive horn; and this illustrates the rudimentary third horn which has occasionally been observed in different two-horned species of the genus, inclusive of the Asiatic R. sumatranus. The anterior horn of the last-named species occasionally attains an extraordinary length and high amount of regular curvature backward, and such an example of it in the British Museum was formerly considered by Dr. Gray to denote a peculiar species, which he named R. Crossii; but I have seen the horns of the same species upon the head, sufficiently developed in like manner to show at a glance that the alleged R. Crossii must be put down as a synonym of R. sumatranus. I learn from Professor Schlegel that R. sumatranus inhabits Borneo as well as Sumatra, and it is likewise generally diffused over the Indo-Chinese countries and Malayan peninsula, as is also the lesser single-horned R. sondaicus, *i.e.* that formerly supposed to be peculiar to Java; whereas the great R. indicus seems to be confined to the base of the eastern Himalaya, inclusive of the valley of the Bráhmáputra and the hills immediately southward of that valley, where the three Asiatic species would appear to meet. I once received satisfactory information of the two-horned R. sumatranus having been killed in Assam, where it is considered an extreme rarity; but I have been quite unable to obtain authentic information of R. indicus having been observed in any province of British Burma, where R. sondaicus has been repeatedly mistaken for it, as likewise in the Bengal Sundarbáns. [This note is published anonymously in the 'Field' newspaper, but I am favoured with the name of the writer, and know him to be an excellent zoologist.—*E. N.*]

Dimensions of large Elephant.—I send you the dimensions of a rogue elephant killed by a friend in the Wynaad Jungles, not long ago. As I do not remember myself ever hearing of a wild elephant, fairly measured, of such a size, I send it to you in case some of your readers may be able to inform me on the point. Height at shoulder, taken by three cross sticks, 11 feet 9 inches; length all over, from extremity of trunk to root of tail, 25 feet 5 inches; eye to tip of trunk 7 feet 7 inches; eye to root of tail 13 feet 4½ inches; tail 4 feet 6½ inches; length of tusks 5 feet 2 inches. I am aware that the tusks are nothing unusual, but, out of a great many elephants I have seen, I never heard of one of such bodily bulk. [Although I have no reason whatever to doubt this statement, which appears anonymously in the 'Field,' I think it most important that it should be authenticated with a real name.—*E. N.*]

Living Birds sold at Moscow.—Here and at St. Petersburgh there are a good many shops where live birds are sold, and even a small market for them. Many of our rarer British birds may be seen at these places, such as the nutcracker, pine grosbeak, crested tit, shore lark, bluethroated warbler, pied flycatcher, golden oriole and waxwing, and even large birds, as the crane, stork, raven and buzzard. Yesterday I saw a white quail: the man asked twenty-five roubles for it, equivalent to £3 15*s.*, which will give some idea of the value the Russians set on an albino.—*J. H. Gurney, jun.; Moscow, September* 13, 1869.

Ornithological Notes from Henley-on-Thames.—1869. April 29. A cream-coloured thrush shot near Nettlebed Wood: there was a white one in company with it, which fortunately escaped. May 3rd. Swifts about in some numbers. 7th. Stonechat's nest with eggs. 26th. Nightjar's eggs. June 12th. A black tern shot. August 22nd. Saw a wheatear.—*E. C. Stubbs; Post Office, Henley-on-Thames, September* 21, 1869.

Rare Birds at Christchurch.—September 1st. Sabine's snipe. 4th. Snipe (bluish ash). 8th. Little bittern. 24th. Gray phalarope and reeve. 28th. Sabine's snipe. The snipe shot on the 4th is a very beautiful specimen, just the colour of a phalarope. The phalarope was shot by Captain Pocock in the harbour, after the late winds.—*William Hart & Sons; West End, Christchurch, Hants, September* 30, 1869.

Ornithological Notes from South Devon.—Black Tern. A young specimen of this species was shot at Torbay, on the 1st of September.

Glossy Ibis. One of these rare birds was shot on the River Dart, not far from Totness, on the 20th of September, and was brought to Mr. Shopland, the naturalist, at Torquay. It is now in my possession, and is nearly in full plumage: its colours are—bill blackish green, tinged with purple; naked skin round the eye dark olive-green; crown and sides of head (as far back as the ear-coverts) dark greenish brown, streaked with dull greenish white; neck, nape, throat and breast deep rich reddish brown; back dark rich green, enlivened with glittering shades of purple and bright green; wings and tail dark brownish green, richly bronzed with purple; below brownish green; legs and feet blackish green. I have given the colour of the ibis thus minutely as it varies to a very great extent in different specimens.

Arctic Tern. Two fine adult birds of this species were shot in Torbay, on the 28th and 29th of September. I heard of a third of these terns (a young bird) being shot a day or two later in the same locality.

Skua Gull. A number of these birds were observed in the bay on the 7th of October. The young pomarine skua answers most nearly to the description I received of these birds from a man who had observed them.—*A. de Hügel; Florian, Torquay, October* 9, 1869.

Effects of the late Inclement and Unseasonable Weather.—The effects of the late inclement and unseasonable weather upon the swallow tribe has been most distressing. Numbers of swifts took refuge and were caught in our churches; I bought several that were caged and set them at liberty; and a relation who was at the time visiting Exmouth told me that a swift flew in at the parlour-window and settled on his knee. It was blowing a gale from the north-east, and the poor birds were flying so feebly and low outside that the boys were knocking them down with sticks and stones. A flock of wild gray geese, too, came in from the sea, and after making the circuit of the neighbourhood, high in the air, went off to sea again with loud cacklings.—*John Gatcombe; 8, Lower Durnford Street, Stonehouse, Devon.*

Honey Buzzard in Norfolk.—On the 18th of September a fine male honey buzzard was shot at Webbon: it was brought by a friend to me for preservation. On dissection I found its crop and stomach to be literally crammed with wasps, larvæ and pieces of honeycomb: I took quite half-a-pint of food from them.—*T. E. Gunn;* 21, *Regent Street, Norwich.*

Ring Ouzel in Cornwall and Devon.—The ring ouzel pays us a double visit generally in the South of England: they may be seen in the spring months on their way to northern countries to breed, and in the autumn the old birds and the broods of the season may be observed on their southern return to the temperate countries. Flocks of these birds may be now observed on our tors and cairns on the Boughton, Brownailly and Kilmar ranges of our moors, and sometimes thirty or more may be seen on a mountain ash together, for the sake of the berries. Although the ring ouzel moves north and south in large numbers, a great number remain in the spring and summer months on Dartmoor and the Cornish moors to breed, and may be thus observed all through the summer with their nests, eggs and young. The blackbird has been represented as displaying the most perfect symmetry and proportions in the shape and size of its several members, relatively, of all birds; the ring ouzel is equally so.—*Edward Hearle Rodd; Penzance, September* 20, 1869.

Nest of Blackbird with White Nestlings.—During the season a blackbird's nest containing five nestlings, two white and the other three of the usual coloured garb, was discovered on Mr. Clarke's premises, at Stuston, in Norfolk.—*T. E. Gunn.*

Variety of the Wheatear.—Pratt has a variety of the wheatear, having a white splash about two inches long on the right side.—*T. W. Wonfor; Brighton.*

Willow Wren's Nest in a Quickset Fence.—This year I found a willow wren's nest with eggs, in a thick thorn fence, some feet distant from the ground.—*G. W. P. Moor; Great Bealings, Woodbridge, May,* 1869.

Chiffchaff's Nest on a Summer-house.—This year a chiffchaff has built and reared its young on the sloping eaves of a summer-house. The nest was ten feet from the ground.—*E. C. Moor; Great Bealings, September* 20, 1869.

Goldencrested Wren nestling in Ivy.—I found two goldencrested wrens' nests, during April of this year, placed against the stems of fir-trees in the ivy surrounding them, and not, as they are generally built, pendant from a fir-branch.—*E. C. Moor; Royal Agricultural College, Cirencester.*

Tawny Pipit near Brighton.—Mr. Guthrie, of Rottingdean, shot on the 6th of September two specimens of the tawny pipit, at Rottingdean. He was attracted by the unusual note of the birds: unfortunately his gun was loaded for larger birds, and they were so much damaged that Pratt has only been able to mount one.—*T. W. Wonfor.*

Rosy Bullfinch and Richard's Pipit at Brighton.—Swaysland has at the present time a living female of the rosy bullfinch (*Pyrrhula rosea*), taken by a birdcatcher on the Downs. I saw at the same time living specimens of Richard's pipit brought in by the birdcatchers.—*Id.*

Sparrows fascinated by a Snake.—Having been for many years past accustomed to make notes in matters of Natural History, I venture to send you a few lines out of my note-book for 1844, as the fact therein recorded seems to illustrate the remarks of Mr. Charles Horne, in his 'Jottings on Snakes,' in the 'Zoologist' for September (S. S. 1809). "On the 26th of August, 1844, I saw a large assemblage of the sparrows belonging to our premises on the gravel-road (under the laburnum tree by the balsam poplar), all looking one way, *viz.* towards the stem of the laburnum. Suddenly and simultaneously they all flew up into it, then quickly returned to the same spot on the gravel-path, taking up the same position; then flying up in a body as before into the laburnum, then returning, &c. While a friend and I were looking at all this, from a window on the ground-floor, we suddenly saw the cause of it. A young snake came slowly gliding across the gravel-road, and then went on along the grass-plot opposite the balsam poplar. While the snake was doing this the sparrows all accompanied it, some hopping after it close to its tail, others on either side, and as if they wished to get a little a-head of it, but apparently afraid; still they seemed pleased with it, and made a kind of merry chirping rather than any angry jangle. The snake, which was about two feet long, moved slowly, as if in weakness. There had just been a shower, and perhaps this rendered its progress over the gravel and grass inconvenient: it went into a bush from the grass, and moved along the branches, and then curled itself up for a while near the bottom of the stem. A robin came and perched very close to it, and seemed quite to disregard us, who had our heads in the bush. More rain coming on, we left the spot, and on our return the snake had disappeared. Both robin and sparrows seemed to be under a fascination, and far more pleased than alarmed at its presence." — *Edward J. Moor; Great Bealings Rectory, Woodbridge, Suffolk, September* 16, 1862.

Jackdaws and Cows.—April 23, 1869. Early this morning I observed from my window some eight jackdaws busily employed on the backs of two white cows, tearing from them as much of their hair as they could conveniently take in their beaks, and flying off with it to their nests, which were placed in different parts of the building.—*E. C. Moor; Royal Agricultural College, Cirencester.*

Hoopoe near Brighton.—A young bird, evidently by its plumage bred here, was shot on the 15th of September, at Preston. This, taken with birds bred in Surrey, may help to establish its claim to be reckoned a British species.—*T. W. Wonfor.*

Swifts on the 15*th of September at Sheerness.*—I noticed a swift here yesterday. Surely this is very late? The late gales have driven a number of terns into the Medway: on Sunday last I saw a flock of thirty or forty, busily engaged fishing, within a very short distance of our sea-wall. As far as I could judge they were all the same species, *viz.* Sterna arctica.—*Gervase F. Mathew; R. N. Barracks, Sheerness, September* 16, 1869.

Nightjar in October.—On the [illegible] of October a nightjar was shot and brought to me: it is a young bird, and on skinning it I found an old wound on the back. May that have caused its remaining here so late?—*Stephen Clogg; East Looe, Cornwall, October* 11, 1869.

Woodpecker laying twenty-two Eggs.—Having noticed a green woodpecker busily engaged for some days boring a hole into a large ash, on the 19th of May, I enlarged the hole sufficiently to admit my hand, and found four eggs. From my last year's experience (Zool. S. S. 1515) I determined to watch the nest and ascertain the exact number of eggs the bird would lay. Passing the tree some days later I again took eggs, and continued paying visits about each alternate day, and generally taking an egg until the 19th of June. During the month (from the 19th of May to the 19th of June) I took twenty-two eggs from this nest.—*G. W. P. Moor; September*, 1869.

Partridge sitting in September.—September 1, 1869. While out shooting I was shown by a gamekeeper a common partridge sitting on ten eggs: she had been sitting about ten days: this I think is unusually late. A few days afterwards another partridge was found to have an egg in its ovary of usual size, but without shell.—*E. C. Moor.*

Number of Eggs laid by Domestic Hens.—Nine hens kept by a friend of mine laid, during last season, one thousand and forty-six eggs, making an average of one hundred and sixteen eggs for each hen: so that in this instance the fecundity of a species has been increased tenfold by domestication.—*Henry Hadfield.*

Double Hen's Egg.—On the 20th of August I was shown by a friend a double hen's egg, consisting of an outer shell of unusual size, with the natural albumen, in which floated another egg of ordinary appearance. The hen died from the effects.—*E. C. Moor.*

Abundance of Landrails.—The landrail has been unusually abundant this season in this neighbourhood. I have seen and heard of upwards of a dozen captures.—*T. E. Gunn ; Norwich.*

Gray Phalarope in Sussex.—Three specimens of the gray phalarope have been recently shot in the county of Sussex, one of which was taken to Pratt and the other two to Swaysland.—*T. W. Wonfor.*

Rednecked Phalarope in the Neighbourhood of Plymouth.—A beautiful specimen of the rednecked phalarope (*Phalaropus hyperboreus*), in perfect summer plumage, was killed, on the 7th of June last, on the Hamoaze, just off Torpoint. The occurrence of this species on the coasts of Devon and Cornwall is very rare at any season, but its appearance in summer is most remarkable; indeed I had never before seen but one Devonshire specimen, and that was obtained in the autumn, and on reference to the volumes of the 'Zoologist' from the year 1845 to 1868 I find that all the specimens, save one, recorded in that publication as having been obtained in England, were killed during the autumn. At any rate the subject of the present notice is the first recorded Devonshire specimen in summer plumage, and the only one, in June, on any part of the coasts of England. It was first observed swimming about on the water in an elegant manner, performing the most graceful and sprightly evolutions in securing its food on the surface. Some boatmen tried to capture or knock it down with their oars, but being unsuccessful it was afterwards shot. It seems strange that although this species breeds in Scotland so few are obtained on our coast; and among the hundreds of gray phalaropes that I have examined from time to time captured on the coast of Devon I could detect but one example of the rednecked species.—*John Gatcombe.*

American Stint at Northam Burrows.—I have just seen the skin of an American stint, which was shot on Northam Burrows in September. The owner, who shot it, saw that the bird was remarkable in flight and note, and compared it with the description in Newman's edition of Montagu's Dictionary. I have told Mr. Vingoe, to whom the bird was sent, and who has examined the specimen with me this evening, to desire the owner to communicate the case to the 'Zoologist,' or let me do so.—*Edward Hearle Rodd ; October* 14, 1862.

Nest and Eggs of the Corn Crake.—Early in June a nest of the corn crake was found in an orchard in the town: it was cut out of a bed of nettles at the foot of a large elm by the gardener, who observed the old bird skulking away among the long grass: it contained nine hard-set eggs. The nest is loosely constructed of coarse grass, interspersed with a few leaves of the nettle and ivy, a dry stalk or two, a bit of moss, and a few small feathers of a yellowish white colour, which may have fallen from the breast of the bird. In shape the nest is not unlike a large plate, rounded off towards the border; external diameter nine inches; internal diameter about four inches and a half. As neither Montagu nor Bewick mentions the size of the egg, and as Macgillivray has made an unaccountable mistake about it, stating that the egg is two inches and one-twelfth in length by one inch and four-twelfths in breadth, and as the error is repeated in the 'Abstract,' it may be as well to give the exact measurements of one of these eggs, which was one inch and a half in length by one inch and one-eighth in breadth. One of the eggs is quite differently coloured from the rest, being of a grayish white, with a slight bluish tinge, profusely spotted with reddish brown at the broad end, the whole intermixed with faintly clouded bluish gray blotches, the spots diminishing in size and number towards the point. Most of the eggs are of a light drab colour, with a grayish tinge, and the reddish brown spots and bluish gray markings are mostly confined to the larger end, and are disposed in irregular blotches, some of considerable size. In one egg the ground colour approaches to a light brown, and is very thickly marked and blotched all over with dark reddish brown and dusky gray. But none of the eggs are of the "light cream-colour" described by Macgillivray. The eggs, though much larger and differently shaped, bear a striking resemblance to those of the missel thrush.—*Henry Hadfield.*

Greenshank and Lesser Tern at Leigh.—On the 18th of September I had the good fortune to shoot an adult greenshank at Leigh: this bird, I am told, is seldom seen there; certainly I have never before seen it during the six years I have known the place. I also obtained four specimens of the lesser tern, an adult and three immature birds.—*A. H. Smee.*

Greenshank near Yarmouth.—A very fine female of this species was sent me on the 20th of September, from the neighbourhood of Yarmouth, being exceedingly fat and oily: it weighed nine ounces.—*T. E. Gunn.*

Cape Pigeon and Gannet in Leicestershire.—Five extraordinary birds, which had evidently got out of their latitude and lost their way, have been seen recently in Leicestershire, and two of them have been captured. It is supposed they have come in a heavy gale, and were unable to get back. One was caught by Mr. Hart, of Rolleston, on the estate of G. Heap, Esq. It was exhausted by long flight, and was unable to rise again into the air. It proved to be the pintado petrel or Cape pigeon, and is a fine specimen, measuring four feet six inches from tip to tip of wings, and its body is fifteen inches long. It lived two days, but would not eat anything. The other is a still more remarkable specimen. It is a gannet, and measures from tip to tip of wings no less than six feet eight inches, the body being two feet ten inches in length. It was taken at Houghton-on-the-Hill by Mr. Tiptaft, alive but nearly exhausted. Still it resisted capture, and attacked the shepherd dog and sheep. The two strangers may be seen at Mr. T. H. Potter's, Billesdon.—*Stamford Mercury, October* 1, 1869. [Communicated by Mr. Cordeaux.]

The Cormorant inland.—On the 1st instant a fine female cormorant, in the second year's plumage, was shot on the margin of the lake at Kimberley Hall, the seat of the Earl of Kimberley. It had been observed about the lake for some days, and appeared to be rather tame. On opening its mouth I found as many as eleven individuals of the common river leach, and three others on its plumage: most of these seemed completely gorged with blood, no doubt from the body of the bird. It was in a rather lean condition, although it appeared to have fared sumptuously in its late quarters. In the course of dissection I found an entire jack of thirteen inches and a half in length; the head, lodging in the stomach, was almost entirely decomposed. The occurrence of this bird so far inland is quite an unusual event, although sometimes an individual has been caught on the river a few miles above Norwich. In carefully examining the body of the present specimen I found an old gun-shot wound on one of its thighs, with a broken bone, which had partly healed up: this impediment may probably account for its being so easily approached.—*T. E. Gunn; October*, 1869.

Little Gull at Brighton.—A specimen of the little gull, not fully moulted, was shot last week near the head of the New Pier, and was taken to Swaysland.—*T. W. Wonfor; October* 16, 1869.

Young Thrasher in Torbay.—A young specimen of this species was caught in Torbay on the 20th of August, measuring (including the tail) four feet seven inches in length. This animal, which has frequently been observed in the bay on previous occasions, and even been unsuccessfully netted, is the second of its kind that has been captured in the bay.—*A. de Hügel; Florian, Torquay, September* 26, 1869.

The last of the Ladybirds.—Like other counties we have had our swarm of ladybirds, and, although generally distributed through the district, it was only this week that their immense numbers became apparent. On Wednesday, the 8th of the month, a strong S.W. wind drove myriads towards the Humber. I was out on this day on the mud-flats after some knot, and saw incredible quantities of these insects helplessly and hopelessly (for the next tide would carry them to sea) struggling in the slime. On the Humber embankments, and for some yards inland, they were so thickly scattered as to make it hardly possible to move without treading on some at each step. In some places I counted thirty to forty in a space my hand could cover. On a single stalk of hemlock there were one hundred and thirty-five, and on a plant of this species from eight hundred to a thousand, giving it the appearance of a pretty berry-bearing shrub; on the lee-side of a post I counted one hundred and eighty-three. There appears to be three, if not four, well-marked species, the common one, however, (*Coccinella 7-punctata*), immensely predominant. I do not think birds eat these insects; at least I have not found this to be the case with any of our common species, as the rook, starling, sparrow, &c. They are hunted up by the cock-tailed beetles (*Staphylinus*), and I have often seen one of these unpleasant creatures walking off with a poor ladybird firmly clasped in its mandibles. The heavy gales of the equinox now daily carry myriads out to sea; and yet to-day, September 16th, I find the entire length (two miles and a half) of the sea-embankment in this parish more thickly covered than ever. On an average there are, along its entire length, twenty-five insects on each square foot; but this is a low average, as in every little sheltered corner, or hollow, they are crowded in dense masses. As fast as these are driven seawards their place is taken by ever-increasing swarms coming from the land. On the crest of the embankment they are thickest, gradually decreasing as we proceed inland. Either the wind or some other cause impels all alike in the same direction, one from which there is no escape, and the mud-flats and Humber finally receive these insect-armies now that their work is done.—*John Cordeaux; Great Coles, Ulceby, September* 18, 1869.

Acari parasitic on a Cecidomyia.—I have to record the occurrence of three specimens of a minute white Acarus on a small Cecidomyia, bred from the terminal tuft of the hawthorn. The body of this Acarus is egg-shaped, slightly flattened; a fringe of silver-white short hairs surrounds the sides of the body; from this fringe there protrude at regular intervals single white bristles, three times as long as the fringe itself. Legs eight, short; a pair of setiform palpi protrudes from the mouth. These creatures were very active, perambulating their host in all directions; when disturbed they fixed themselves in an instant, no matter if to the body or the wings; but I could not detect that they trusted themselves either to the legs or the antennæ of the midge. It remains to be investigated if they are regular parasites or only accidental and troublesome guests. The occurrence of these mites on the body of a living Cecidomyia seems also to throw some light on one of the means by which many species of the former get transported from plant to plant. Dipterists have often been puzzled by meeting, on sundry plants (for instance, in the hawthorn-tufts or the woolly top-shoots of the wild thyme), instead of the expected larvæ of gall-flies, known to cause these deformities, with a progeny of Acari only, and hence have more than once expressed doubts as to whether the former were really the gall-makers. Now, if it could be shown that some species of these Acari met with in galls are carnivorous (and the occurrence of one kind of them on the living fly seems to go towards substantiating this view), the disappearance of the eggs or young larvæ of the fly in the galls would be accounted for. But I have also observed cases where the larvæ of a Cecidomyia are simply inquilines in the pseudo-galls of phytophagous Acaridæ,—for instance, in the maple-leaf gall of Acarus Aceris of Kaltenbach,—and would therefore advocate a strict examination of the excrescence itself, the form of which generally gives a clew to the real maker, and a discrimination between all insects resorting to it, before coming to any conclusion on the intricate question of the relations between gall-makers, inquilines, parasites and accidental visitors.—*Albert Müller; South Norwood, S.E., October* 2, 1869.

Natural-History Notes from Rio.

TO THE EDITOR OF THE 'ZOOLOGIST.'

Bloxworth, October 5, 1869.

DEAR SIR,

The following extracts from a letter just received from Mr. Henry Rogers, of Freshwater, Isle of Wight (who with his son has gone on a collecting expedition to South America), may perhaps be of interest to those concerned for the success of the trip.

Faithfully yours,
O. P.-CAMBRIDGE.

Rio Janeiro, September 7, 1869.

My Dear Sir,

* * * * While we are making our arrangements for going into the interior I will give you a few jottings (uninteresting though they may be) from my journal of our voyage out.

August 9, 1869. Left home to-day; arrived at Yarmouth, found that we could not catch the train at Lymington for Southampton, took the steamboat to Cowes, hired a boat to put us on board the "Oneida" for Rio Janeiro. Strong N.W. wind and heavy sea: just as we passed Calshot Castle a sudden gust of wind carried away our mast and sails, completely disabling us; fortunately the yacht "Mars" (owner, Mr. R. Poppleton, of Bermondsey), seeing our signals of distress, bore down to our assistance, took us on board, treated us with every kindness, towed our disabled boat and put us on board the "Oneida"; except for this timely help we must have lost our passage. Left Southampton at 3.30 P.M., passed the Needles at 5.30, and took a last farewell of home and friends for at least two or three years. Everything on board very clean and comfortable. Seas rather heavy, and much sea-sickness among the passengers, which, however, I escaped, being a good sailor. Numbers of the Manx shearwater (*Puffinus Anglorum*) in the Bay of Biscay; very interesting to watch their peculiar flight: they seemed to be guided by a leader, every individual simultaneously showing first the dark side then the light under-side of its plumage, similar to the dunlins. A lady passenger caused much amusement by her fears, and threats to report to the Captain a design she imagined to exist for filling her cabin with coals through one of the "ventilators:" her ideas as to the use of these last arose from a joking answer to an inquiry about the purpose for which they were intended.

Thursday, August 12, off Cape Finisterre. A whale seen.

Friday, 13. Arrived at Lisbon; landed, and visited the town and market: fruit very cheap and abundant; grapes three-halfpence per pound; peaches eighteen for one shilling. Town well-constructed; inhabitants civil and obliging; scenery up the river very picturesque. Left Lisbon at 2 P.M. Large numbers of flying-fish; at times they seemed like a shower on the water.

Sunday, 15. Attended Divine Service. A bird very much resembling the Cape pigeon came on board. Numbers of stormy petrels round the ship, and several species of gulls.

Monday, 16. Off Teneriffe, 5 A. M. The different tints on the peak as the sun rose very beautiful; a village on the mountain seen to great advantage, the white roofs standing out in bold relief against the dark mountain-sides. Wind very strong (but fair). Some little excitement caused by the splitting of some of our sails, but life on board being dull, most of us felt glad of anything for a change. Flying-fish to-day by thousands, their gambols very pleasing to watch. A large turtle passed the ship, the first I had ever seen in its native element: saw also several Nautilus and cuttle-fish.

August 19. Arrived at St. Vincent; landed and set to work; captured some fine spiders and several beetles.

Pernambuco. Did not land, as a boat for us both would have cost thirty shillings, and we could only have had two or three hours on shore.

August 28. Landed at Bahia, and had four hours' ramble and scramble; captured four species of butterflies, two of beetles, some shells, a very beautiful frog, and some beautiful spiders. Bahia gives evidence of being a good collecting-ground, and no doubt far richer if one could have got into the interior. The sample of tropical forest life seen here makes us long to get to Minas; but by the time we reach that place we shall be penniless, as we hear the expenses of land-travelling are enormous: still we are determined to do our best. One of the spiders caught here is very interesting; its nest placed in a rose-bush and formed beautifully of rose-leaves, and the spider itself very difficult to discern. Some of the spiders obtained here are perfectly lovely, beyond everything I have ever conceived a spider could be.

Rio de Janeiro. All well and safely landed, after a pleasant voyage, and the kindest treatment from the captain (Reeks) and every one of the officers.

September 9. * * * * We have made our arrangements and are going up the river Doce, and to work to the interior of Menes Geraus? There are no inhabitants beyond Espiritode Santos. All the naturalists here say it is the richest collecting-ground in Brazil, but all are afraid to go up the river on account of fever and Indians; but we are off and have no fears. It will cost us about £30 to get to Santos, from whence we must get up in canoes.

Please direct letters here to the British Consul, who has promised to forward them. I will write again when we get to the Doce.

Yours truly,

H. ROGERS.

To Rev. O. P.-Cambridge.

Notes on the Mammalia of Norfolk (continued from S. S. 553).—Polecat. This is getting scarcer each year in this neighbourhood: two examples only have passed under my examination since my last notes, but I have also heard of two or three others being trapped by keepers; and during the first week of November, 1867, a very large male was exhibited at a dealer's stall in the Yarmouth Market; it had been killed somewhere in the neighbourhood.

Stoat. In January, 1868, two stoats were sent me, one almost entirely white and the other in its brown dress, without the slightest indication of change. I had always considered these respective garbs as seasonal, and indicative of summer and winter. Not having heard of any similar instance, I think it rather unusual.

Badger. I have not heard of the occurrence of a Norfolk badger since I recorded one in 1864 (Zool. 9016), and a second in the folllowing year (Zool. S. S. 152); but omitted to record the occurrence of a female in 1862 in this neighbourhood. In 1865 a female and two young ones were captured alive in Suffolk, just beyond the boundary of this county, and were kept alive for some time in the possession of a person named Clarke, but what has since become of them I cannot ascertain.

Otter. The otter is still of frequent occurrence in Norfolk, and will probably remain with us as long as their haunts, our famous Broads, are undisturbed by cultivation; notwithstanding several are killed off every year. The undermentioned are the specimens that have passed under my examination:—January, 1868. A female and two young from North Wooton. February 27, 1869. Young one from Hickling. March 9, 1869. Two young were caught alive at Trigby, near Yarmouth, in a straw stack: the old one was with them, but succeeded in making good her escape. She is believed to have littered there—a most unusual locality, as the stack was more than three-quarters of a mile from the river. Mr. T. Southwell informs me of a fine specimen taken at Barsham about this date. An old otter, a female, and two young (about a fortnight old) were captured, about the same time, in the neighbourhood of Yarmouth; the coats of the latter presented two distinct shades of colour, one being of a very pale brown, and the other very dark, nearly as dark as the adult; the mother was slightly piebald, having a few small patches of white on the crown of its head and neck.

Mole. A beautiful cream-coloured variety was captured, in July last, in this neighbourhood.

Hedgehog. October, 1867. A gamekeeper near Norwich has lately informed me of a curious fact, illustrating the carnivorous propensity of the hedgehog. He says, "On going my rounds one morning to examine the traps I had set the night previous, I found, on approaching one that was placed at the foot of an old gate-post, a rabbit caught by its hind legs; it was jerking and tearing itself about in a fearful manner: I stood still and watched it a minute or two, when I saw a hedgehog emerge from some foliage opposite, and attack it by springing at it and fastening itself to its head, which it commenced biting and tearing, whilst the poor victim was making every attempt to escape its two-fold misfortune. So intent was the hedgehog on its prey that I approached and despatched it before it made an endeavour to escape. I then examined the rabbit and found one side of its face eaten and torn away by the repeated attacks of its foe." The carnivorous propensity of the hedgehog has been before observed, but I do not remember an instance where an individual has made so bold an attack on so large a prey, but have no doubt the fact in this case was owing to the inability of the rabbit to escape.

Rat. October 4, 1867. A male, whose entire coat was of a creamy white, excepting a few brownish hairs scattered over the crown of its head, was killed by a dog at Florden: it had black eyes. On referring to some former notes of mine I find a record of a similar variety killed near Aylsham on the 12th of October, 1860.

Squirrel. I have on several occasions been informed that the squirrel indulges in the habit of sucking birds' eggs, and in support of this assertion individuals have occasionally been caught in traps baited with eggs when actually engaged in the fact, the offender when caught generally showing unmistakable proof of guilt by having its mouth and face besmeared with the yelk, and fragments of the shell being sometimes found attached. I have met with no particular variation in the dress of the squirrel, but have two individuals in summer dress, one with a black and the other with an entirely white tail.

Rabbit. A young male was shot at Langley on the 18th of February, 1868, having its entire coat (excepting one of its fore feet, which was white) of a glossy black: in a note in the 'Zoologist' (Zool. 9646) I have recorded a previous instance of the occurrence of this variety.

Fallow Deer. A beautiful white stag of this species, mottled with patches of the normal coloured garb, was killed at Buxton, in September, 1868, the head of which I preserved.

Grampus. A grampus, weighing 4 cwt., was brought into Yarmouth Harbour on Tuesday, the 25th of June, 1867, by the fishing lugger "Champion:" it was soon afterwards removed to this city for exhibition.—*T. E. Gunn.*

Tits and their Food.—"The relative amount of good and evil effected by our smaller birds is a constant subject of dispute, opinions being formed according to the prejudices of the advocate rather than on evidence of a reliable character. The tits are usually regarded as insectivorous; but it appears that one of the smaller species, the cole tit, has been seen in numerous flocks near London attacking the filberts, perforating through the shell and devouring the kernel. The fact is undoubted, as the contents of the stomach proved, under microscopical examination, to consist almost exclusively of the fragments of kernels. The common nuts have been destroyed in a similar manner in some parts of Nottinghamshire, but the depredators have not been detected." In reference to this paragraph, extracted from the 'Field' newspaper, having paid much attention to tits, their food, actions, &c., for many years, I would like to suggest a different motive for their attacking the filberts. As long ago as 1855 a notice appeared in the 'Gardeners' Chronicle' of the alarming increase of the oak-gall, caused by the gall-fly (*Cynips Quercus*), and expressing great fears for the welfare of our oak trees and coppices, unless some check was soon put to the spread of the galls. In the May number of the 'Naturalist' of the following year I recorded the fact that the galls were being destroyed to a very great extent by titmice for the sake of the grub contained in them, and on which they were feeding; at the same time I expressed a hope that this would be a check to the spread of the threatened evil: this hope has been fully sustained, as I have yearly seen, since that time, the same destruction of the grub going on, thereby checking the threatened injury, and doing a vast amount of good. There cannot be any doubt but that the sole reason of the titmice attacking the galls is for the sake of the grubs they contain, yet I have no doubt if their stomachs were examined after so feeding that some portions of the gall would be found accidentally swallowed, but not as an article of food. The galls formed by Cynips Quercus are round and almost as hard as filberts, yet a certain instinct or other power has taught the titmice that they contain an insect in the shape of a grub which is good food for them: so I believe the same power, whatever it be, has taught them that certain filberts also contain the same *bonne bouche* for them. Hence I would suggest that their attacks on the filberts arise from the same cause; that the grub is the great, if not the sole inducement, and that only those filberts containing a grub are so attacked: I cannot say that they may not take a portion of the kernel after they have cracked their nut, but, as it requires "microscopical examination" for the detection of the fragments they swallow, the "devouring" of the kernel can be but trifling. It would be interesting to know whether the grub in the filberts are more plentiful this year than usual; if they are, that would account for the more active attacks by the titmice on them. Common hazel nuts have been very abundant with us this year, but I have not heard of or remarked any such destruction among them, as recorded in the extract from the 'Field,' nor can I say whether or not they are more infected by grubs than usual, as I am not a nut eater. I would advise filbert-growers to make further inquiries into the matter before they commence a war of extermination against the titmice, unless by so doing they destroy their best friends instead of their enemies. Titmice were a great source of amusement to me in my youthful days, "when George the Third was King." My home was in a town containing some thousands of inhabitants; the house I resided in was situated in the centre of the town, adjoining (and the back premises abutting on) the Butchers' Market, which was open to the public but one day in the week: it was a large open square surrounded by houses, the butchers' stalls being on all sides of the square. In the winter season, during the non-market days, it was the resort of a large number of titmice, coming there for the sake of the fragments of meat, suet, &c., left adhering to the stalls. My amusement arose from trapping them, by means of a large wire-spring trap-cage, set for them in a large mulberry tree, which grew in a small plot of ground at the back of our house, overhanging the market-house, and frequently do I remember taking as many as a dozen in a day: in the evening came my chief amusement, in watching their various actions when the door of the cage was opened for them to escape: some would instantly scud away over the house tops; others would quietly hop about the tree, as if careless of their freedom; whilst some few, more irate than the others, would hop to the upper part of the tree, and there put themselves in the most grotesque attitudes, at the same time pouring out a continuous stream of chatter, whether intended as a parting blessing or otherwise I cannot say, being unacquainted with bird language. After a great many years' observation I am convinced that the harm done by titmice is vastly out-balanced by the good they do, in the destruction of the myriads of insects consumed by them as food; and I believe if they and other insectivorous birds were protected instead of persecuted and destroyed as they now are, that we should not hear of so much destruction of fruit by insects as we now do.—*Stephen Clogg.*

Jackdaws.—At Heathfield Park, Sussex, in May, 1869, I found three nests of the jackdaw, one in a rotten stump not above four feet from the ground; all with unfledged young ones. I saw great quantities in the ruins at Hurstmonceux Castle, where they have monopolized the old dovecotes in the ruined towers.—*E. D. Hamel; Tamworth.*

Nightjar at Heathfield Park, Sussex.—A good many may be seen in the park at nightfall, flying in parties of three or four close to the top of the birch plantations: they begin to "jar" about eight o'clock, and keep it up until very late. I heard them at midnight.—*Id.*

30 DE69

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